

# HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

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<b>Hatchery Program:</b>	Glenwood Springs Fall Chinook
<b>Species or Hatchery Stock:</b>	Samish/Glenwood ( <i>Onchorynchus tshawytscha</i> ) Samish/Glenwood stock
<b>Agency/Operator:</b>	Long Live the Kings
<b>Watershed and Region:</b>	Eastsound (San Juan Islands) N. Puget Sound
<b>Date Submitted:</b>	August 23, 2002
<b>Date Last Updated:</b>	August 20, 2002

## **SECTION 1. GENERAL PROGRAM DESCRIPTION**

### **1.1) Name of hatchery or program.**

Glenwood Springs Fall Chinook

### **1.2) Species and population (or stock) under propagation, and ESA status.**

Samish/Glenwood Springs Fall chinook (*Oncorhynchus tshawytscha*), not in ESU

### **1.3) Responsible organizations and individuals**

**Name(and title):** Mike O'Connell, Hatchery Manager  
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#### **Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:**

Washington Department of Fish and Wildlife (WDFW) provides funding, project planning and overview.

### **1.4) Funding source, staffing level, and annual hatchery program operational costs.**

Funding for the yearling program is provided by the WDFW Puget Sound Recreational Enhancement Program. Staff level is one full time and one part time employee, with substantial volunteer effort. The annual budget is approximately \$100,000 per year.

### **1.5) Location(s) of hatchery and associated facilities.**

Glenwood Springs is located on the eastern shore of East Sound, Orcas Island, Washington. The facility is located on 300 acres of private property. It includes the springs that supply the water to the hatchery and associated rearing ponds, the entire "watershed" and the saltwater bay to which the fish return.

### **1.6) Type of program.**

Isolated harvest

**1.7) Purpose (Goal) of program.**

The goal of this program is harvest augmentation: to produce fish for recreational fishers in Puget Sound.

**1.8) Justification for the program.**

This program utilizes a local hatchery stock and is located in an ideal location for selective fisheries. The fish return to a unique terminal area with no other salmon-bearing streams in the San Juan Islands.

**1.9) List of program "Performance Standards".**

**1.10) List of program "Performance Indicators", designated by "benefits" and "risks."**

Performance Standards and Indicators for Puget Sound **Isolated Harvest** Chinook programs.

Performance Standard	Performance Indicator	Monitoring and Evaluation Plan
Produce adult fish for harvest	Survival and contribution rates	Monitor catch and cwt data
Meet hatchery production goals	Number of juvenile fish released	Future Brood Document (FBD) and hatchery records
Manage for adequate escapement where applicable	Hatchery return rates	Hatchery return records
Minimize interactions with listed fish through proper broodstock management and mass marking. Maximize hatchery adult capture effectiveness. Use only hatchery fish	Number of broodstock collected	Rack counts and CWT data
	Stray Rates	Spawning guidelines
	Sex ratios	Hatchery records
	Age structure	
	Timing of adult collection/spawning	Spawning guidelines Hatchery records
	Adherence to spawning guidelines	
	Total number of wild adults passed upstream	

Minimize interactions with listed fish through proper rearing and release strategies	Juveniles released as smolts	FBD and hatchery records
	Out-migration timing of listed fish / hatchery fish	FBD and historic natural outmigration times
	Size and time of release	FBD and hatchery records
	Hatchery stray rates	CWT data and hatchery records (marked vs unmarked)
Maintain stock integrity and genetic diversity	Effective population size	Spawning guidelines
	Hatchery-Origin Recruit spawners	
<p>Maximize in-hatchery survival of broodstock and their progeny; and</p> <p>Limit the impact of pathogens associated with hatchery stocks, on listed fish</p>	Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health	Co-Managers Disease Policy
	Fish pathologists will diagnose fish health problems and minimize their impact	Fish Health Monitoring Records
	Vaccines will be administered when appropriate to protect fish health	
	A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings	
	Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.	

Ensure hatchery operations		
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comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Monthly NPDES records
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**1.10.1) “Performance Indicators” addressing benefits.**

1. All fish will be marked with an adipose fin clip, which will allow a selective fishery if warranted.

**1.10.2) “Performance Indicators” addressing risks.**

1. Coded-wire tag (CWT) data for the yearling portion of the program will be analyzed in the next few years. Fishery contribution, survival and straying will be examined.
2. The facility has the ability to attract returning fish directly into the fish ladder from Eastsound, or to allow the fish to remain in the fishery (by “turning off” the ladder). This enables managers to collect all fish if desired, removing them from the sound, and eliminating straying.
3. All fish are reared exclusively on Glenwood Springs water source prior to release, which should be beneficial in homing.

**1.11) Expected size of program.**

**1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).**

During the past seventeen years, annual broodstock collection has varied from 62 to 3700 adults. On average, we expect an annual run size of 400-1000 fish to the hatchery.

**1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.**

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fingerling	Eastsound at hatchery site	300,000
Yearling (smolt)	Eastsound at hatchery site	200,000

**1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.**

The only complete coded-wire tag data available for Glenwood Springs fall chinook indicates a 3.07% survival of the 1985 brood yearling release. Fall chinook fingerling releases have not been coded-wire tagged.

The 1996 and 1997 brood yearling releases were coded-wire tagged and complete survival information should be available soon.

The program at Eastsound was primarily a release of zero-age smolts until the start of the current PSRE program with brood year (BY) 1996. Returns to the hatchery alone (does not include commercial or sport harvest) for the brood years of 1990-95 were an average of 0.5% of the sub-yearling release (four year olds only).

**1.13) Date program started (years in operation), or is expected to start.**

Sub-yearling releases of fall chinook began in 1979, with some yearlings also released some years. The PSRE program began in 1996.

**1.14) Expected duration of program.**

The program is re-negotiated with WDFW each year.

**1.15) Watersheds targeted by program.**

Eastsound, San Juan Islands

**1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.**

There are no alternative actions being considered.

## **SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.**

### **2.1) List all ESA permits or authorizations in hand for the hatchery program.**

There are no permits in hand.

### **2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.**

#### **2.2.1) Description of ESA-listed salmonid population(s) affected by the program.**

**- Identify the ESA-listed population(s) that will be directly affected by the program.**

No ESA listed population directly affected

**- Identify the ESA-listed population(s) that may be incidentally affected by the program.**

Puget Sound chinook

#### **2.2.2) Status of ESA-listed salmonid population(s) affected by the program.**

**- Describe the status of the listed natural population(s) relative to “critical” and “viable” population thresholds**

Puget Sound chinook are viable.

**- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.**

**-Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.**

**-Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.**

There are no appropriate chinook salmon spawning grounds in the vicinity. The most recent recoveries of strays from this program have been into the Skagit River. One (1) fish was recovered on the spawning grounds in both 1989 and 1996. Future tagging (Ad + CWT) needs to be proposed to address the straying into other watersheds.

**2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take**

**- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.**

Take of listed fish may occur in during broodstock collection. The likelihood of listed chinook straying into the small ladder on Eastsound is unlikely, given the fact that there are no naturally reproducing chinook stocks within the San Juan Islands.

**- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.**

NA

**-Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).**

We anticipate no lethal direct take. Natural-origin listed chinook, which may stray into the adult holding pond, can be returned to the bay.

**- Describe hatchery activities that may lead to the take of listed salmonid**

None

**- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.**

Not applicable



### **SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES**

**3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review Report and Recommendations* - NPPC document 99-15). Explain any proposed deviations from the plan or policies.**

None

**3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.**  
This program operates with a Purchased Services Contract with WDFW.

**3.3) Relationship to harvest objectives.**

**3.3.1) Describe fisheries benefiting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.**

In past years, both tribal and non-tribal fishers caught Glenwood Springs fall chinook. That commercial fishery in Eastsound was curtailed to protect the dogfish (*Squalus acanthus*) nursery.

The current fisheries that benefit from this program are primarily sport fishing in the San Juan Islands and southern British Columbia. Harvest levels will be determined when CWT data is analyzed in the next few years.

**3.4) Relationship to habitat protection and recovery strategies.**

There are no habitat protection issues in this watershed. The entire watershed is controlled by private ownership.

**3.5) Ecological interactions.**

Low sub-yearling (fingerling) release numbers likely pose no competition risks in marine waters, and yearlings won't be concentrated in juvenile chinook migration areas where predation might be a factor.

## **SECTION 4. WATER SOURCE**

**4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.**

The water source is several springs that emerge on the property at approximately 300-600 gallons per minute (gpm). It is fish and specific pathogen free. The water temperature is 48-50 degrees F at emergence, with higher and lower temperatures where exposed to hot or cold air temperatures. The only limitation to production is the diminished flow of water that occurs during dry periods (late summer).

**4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.**

There is no chance of natural fish being affected by the hatchery water withdrawal because the water sources are fish free.

## **SECTION 5. FACILITIES**

### **5.1) Broodstock collection facilities (or methods).**

The returning adults swim directly from Eastsound into a short (less than 100 feet long) ladder which ends in a large (30'x 30'x 12'deep) concrete pond supplied with both fresh and salt water. The ladder can be closed to allow fish to remain in salt water.

### **5.2) Fish transportation equipment (description of pen, tank truck, or container used).**

Not applicable

### **5.3) Broodstock holding and spawning facilities.**

The fish are held in the same pond, referred to above, until spawning. The mature adults are spawned under cover in an adjacent area.

### **5.4) Incubation facilities.**

The eggs are incubated in vertical incubators and held there until ponding.

### **5.5) Rearing facilities.**

The fish are reared in earthen ponds. The first rearing pond is of irregular shape (roughly 150'x 30'x 5'deep). Final rearing, after adipose fin clipping, is done in a large (5 acre) lake.

### **5.6) Acclimation/release facilities.**

Fish are incubated and reared on Glenwood Springs water. They are acclimated to salt water in the adult holding pond prior to release.

### **5.7) Describe operational difficulties or disasters that led to significant fish mortality.**

There have been no operational disasters that led to significant mortality.

### **5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.**

There is no likelihood of lethal take of listed fish due to facility operation.

## **SECTION 6. BROODSTOCK ORIGIN AND IDENTITY**

**Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.**

### **6.1) Source.**

Broodstock source is adult fall chinook returning to the Glenwood Springs facility.

### **6.2) Supporting information.**

#### **6.2.1) History.**

The fall chinook are all of Samish origin. Green River-origin chinook eggs were first transferred to the Samish Hatchery in 1929, supplanting Columbia River-origin eggs (Kalama River and Wind River) as a source of fall chinook production for the facility (WDFG, 1932), which were first transferred in by the Feds in 1914 (WDFG, 1916). A consistent year-to-year chinook salmon egg transfer program from Green River to Samish began in 1938, in an attempt to "create a return to the Samish River that could be self-sustaining" (WDF, 1938). No chinook eggs were taken from broodstock returning to Samish prior to 1937, after which time, the chinook return was built to a sufficient level to provide egg takes (WDF, 1939; 1941). GSI analysis identifies this stock as typical of Puget Sound fall chinook (especially Soos Creek origin) and different than lower Columbia tule stocks. This stock has been propagated with no new introductions for the last four generations without significant input of genetic material from other sources, including Soos Creek. There were small releases of Skykomish summer chinook and Nooksack spring chinook from Glenwood Springs. These stocks had a different run and spawn timing from the Samish fall chinook and precautions were taken to exclude them from fall chinook eggtakes.

#### **6.2.2) Annual size.**

400-1000 returning adults

#### **6.2.3) Past and proposed level of natural fish in broodstock.**

The level of natural fish in the broodstock is unknown.

#### **6.2.4) Genetic or ecological differences.**

The Samish chinook stock is ecologically similar to Green River fall chinook. It is unknown how similar genetically they are to fall chinook in northern Puget Sound and San Juans.

#### **6.2.5) Reasons for choosing.**

This stock is used because of the history of success – since a small stream with no salmon now produces a viable contribution to the catch.

#### **6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.**

Chinook are adipose-fin clipped prior to release, allowing differentiation of the returning adults from listed fish.

## **SECTION 7. BROODSTOCK COLLECTION**

### **7.1) Life-history stage to be collected (adults, eggs, or juveniles).**

Fish are collected as mature adults and jacks.

### **7.2) Collection or sampling design.**

Fish are collected throughout the timing of the run. The primary egg source shall be from broodstock returning to Glenwood Springs. Samish Hatchery will act as a secondary backup supply if additional eggs are needed.

### **7.3) Identity.**

There are no other stocks of salmon present in Eastsound, all fish released need to be identified by an external mark, and fish must volunteer into a small ladder with distinct water supply. Therefore, identification of broodstock is not a problem.

### **7.4) Proposed number to be collected:**

#### **7.4.1) Program goal (assuming 1:1 sex ratio for adults):**

All fish which swim into the adult holding pond will be collected (400-1000).

**7.4.2) Broodstock collection levels for the last 12 years (e.g. 1988-99), or the most recent years available:**

Year	Adults Females	Males	Jacks	Eggs	Juveniles
1988	150	154		600,000	
1989	100	134		400,000	
1990	87	100		348,000	
1991	30	32		100,000	
1992	222	858		1,100,000	
1993	1700	1950	76	2,000,000	
1994	402	265	40	1,694,000	
1995	75	78	81	300,000	
1996	250	250	200	1,250,000	
1997	500	520	177	2,000,000	
1998	150	150	70	600,000	
1999	150	148	109	600,000	
2000	50	50		100,000	
2001	600	622	120	1,579,800	

**7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.**

The fish will be disposed by sale to proper buyer, donations to food banks, burial or placement in the salt water environment – as coordinated by WDFW staff.

**7.6) Fish transportation and holding methods.**

Fish are held in the pond described in Sec. 5.1.

**7.7) Describe fish health maintenance and sanitation procedures applied.**

Broodstock will have salt water pumped into the pond to act as a prophylactic anti-fungal. A WDFW pathologist acts as an advisor to address other fish health needs.

**7.8) Disposition of carcasses.**

WDFW staff will coordinate disposal of carcasses and these will be used for the following purposes: burial, food banks, or placement into Eastsound (for nutrient enhancement).

**7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.**

Unmarked chinook returning to Glenwood Springs will be returned to saltwater.



## **SECTION 8. MATING**

**Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.**

### **8.1) Selection method.**

Adults are selected randomly when ripe.

### **8.2) Males.**

Random selection, killed at spawning, used 1:1.

### **8.3) Fertilization.**

Random selection, killed at spawning, used 1:1.

### **8.4) Cryopreserved gametes.**

Not applicable

### **8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.**

Not applicable

## **SECTION 9. INCUBATION AND REARING -**

**Specify any management *goals* (e.g. “egg to smolt survival”) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.**

### **9.1) Incubation:**

#### **9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.**

All available eggs are taken, after consultations with WDFW for their potential need. Survival rate to ponding is approximately 90%.

#### **9.1.2) Cause for, and disposition of surplus egg takes.**

Excess eggs would occur if there were too many eggs taken in anticipation of a need from WDFW. Disposal would be by burial or placement into Eastsound (nutrient recycling).

#### **9.1.3) Loading densities applied during incubation.**

4000 eggs per tray.

#### **9.1.4) Incubation conditions.**

Spring water 48 –50 degrees F, 3 gpm per half stack

#### **9.1.5) Ponding.**

Fish are ponded after consultation with WDFW pathologist, using small transfer containers to the small rearing pond.

#### **9.1.6) Fish health maintenance and monitoring.**

Fish are examined prior to ponding by a WDFW fish pathologist

#### **9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.**

Not applicable

## **9.2) Rearing:**

**9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available.**

Survival is estimated to be 95% from unfed fry to zero-age smolt and 88% from transfer to large rearing pond to release. The drop in survival is attributed to natural causes, primarily predation in the natural rearing pond. We think the fish become conditioned to the avian predators and are therefore better adapted, upon release, for survival in the natural environment.

**9.2.2) Density and loading criteria (goals and actual levels).**

Fish are reared at very low densities – difficult to measure because of the nature of the rearing containers and varying natural flow. They are monitored regularly by the WDFW pathologist, whose assessment of the fish quality supports this “low density” claim.

**9.2.3) Fish rearing conditions**

Fish are reared in earthen ponds on spring water, monitored regularly by WDFW fish pathologist and daily by LLTK staff. The fish eat a large amount of natural feed, as is evidenced by the below 1:1 feed conversion rate. Dissolved oxygen and other water quality parameters are monitored but not manipulated. To date, there have been no problems with rearing conditions.

**9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.**

These fish are not reared in typical hatchery ponds or sampled at the same level of frequency since they are in systems which mimic the natural environment. Growth is monitored and feed adjusted as needed. The weight at release is approximately 90 fpp for zero-age fish and 7 fpp for yearlings.

**9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.**

**9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).**

Fish eat the food supplied by WDFW, as is available through their state contract. Fish are fed at a maximum of 2% body weight per day and are supplemented by natural food.

**9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.**

These fish are checked routinely by WDFW fish pathologist. Disease treatments are prescribed by the Fish Health Specialist as needed.

**9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.**

None used.

**9.2.9) Indicate the use of "natural" rearing methods as applied in the program.**

Fish are reared in natural, earthen ponds, with a tremendous amount of natural food. The yearlings are exposed to avian (and other) predation and are thought to learn avoidance. Fish are fed by hand according to apparent need, instead of following a prescribed formula.

**9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.**

Not applicable

## **SECTION 10. RELEASE**

**Describe fish release levels, and release practices applied through the hatchery program.**

### **10.1) Proposed fish release levels.**

<b>Age Class</b>	<b>Maximum Number</b>	<b>Size (fpp)</b>	<b>Release Date</b>	<b>Location</b>
<b>Eggs</b>				
<b>Unfed Fry</b>				
<b>Fry</b>				
<b>Fingerling</b>	300,000	90	May	Eastsound
<b>Yearling</b>	200,000	7	April	Eastsound

### **10.2) Specific location(s) of proposed release(s).**

<b>Stream, river, or watercourse:</b>	Eastsound, Orcas Island (saltwater)
<b>Release point:</b>	saltwater
<b>Major watershed:</b>	none
<b>Basin or Region:</b>	San Juan Islands (N. Puget Sound)

**10.3) Actual numbers and sizes of fish released by age class through the program.**

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1988					250,000	43 (fpp)		
1989					0			
1990					365,000	90		
1991					400,000	90	21,400	
1992					60,000	80	7,800	
1993					80,000	100	170,900	6 fpp
1994					450,000	70		
1995					450,000	75		
1996					450,000	75		
1997					500,000	80	107,000	10 fpp
1998					400,000	90	109,000	4 fpp
1999					367,000	95	195,000	4.7 fpp
2000					300,000	85	189,000	5 fpp
2001					0		190,000	8 fpp
2002					100,000	100	195,000	8fpp
Average					333,000 5 yr avg.		175,000 5 yr avg.	

**10.4) Actual dates of release and description of release protocols.**

Fish have been released during the months of April - July.

**10.5) Fish transportation procedures, if applicable.**

NA

**10.6) Acclimation procedures**

Fish are acclimated to salt water for several days prior to release.

**10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.**

The fingerling and yearling releases are 100 percent adipose fin clipped.

**10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.**

We do not anticipate any excess fish. Any excesses would be dealt with in consultation with WDFW.

**10.9) Fish health certification procedures applied pre-release.**

WDFW fish pathologist will examine the fish prior to release.

**10.10) Emergency release procedures in response to flooding or water system failure.**

There have not been floods or other failures at Glenwood Springs and we do not anticipate such in the future.

**10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.**

None.

## **SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS**

### **11.1) Monitoring and evaluation of “Performance Indicators” presented in Section 1.10.**

The purpose of a monitoring program is to identify and evaluate the benefits and risks which may derive from the hatchery program. The monitoring program is designed to answer questions of whether the hatchery is providing the benefits intended, while also minimizing or eliminating the risks inherent in the program. A key tool in any monitoring program is having a mechanism to identify each hatchery production group.

Each production group shall be identified with distinct otolith marks, adipose clips, coded wire tags, blank wire tags or other identification methods as they become available, to allow for evaluation of each particular rearing and/or release strategy. This will allow for selective harvest on hatchery stocks when appropriate, monitoring of interactions of hatchery and wild fish wherever they co-mingle in riverine, estuarine and marine habitats and assessment of the status of the target population. WDFW shall monitor the Chinook salmon escapement into the target and non-target Chinook populations to estimate the number of tagged, un-tagged and marked fish escaping into the river each year and the stray rates of hatchery Chinook into the rivers.

#### **11.1.1) Describe plans and methods proposed to collect data necessary to respond to each “Performance Indicator” identified for the program.**

See section 1.10.

#### **11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.**

Pending funding availability, both the fingerling and yearling groups will be coded-wire tagged (Ad + CWT) to allow for monitoring and evaluating the program for fisheries contribution, total survival and straying into other watersheds. Funding and resources will be committed to monitor and evaluate this program as detailed in the Resource Management Plan for Puget Sound Chinook Salmon Hatcheries (Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, August 23, 2002)

### **11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.**

Monitoring and evaluation will be undertaken in a manner which does not result in an unauthorized take of listed Chinook



## **SECTION 12. RESEARCH**

**12.1) Objective or purpose.**

No research is planned

**12.2) Cooperating and funding agencies.**

**12.3) Principle investigator or project supervisor and staff.**

**12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.**

**12.5) Techniques: include capture methods, drugs, samples collected, tags applied.**

**12.6) Dates or time period in which research activity occurs.**

**12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.**

**12.8) Expected type and effects of take and potential for injury or mortality.**

**12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached “take table” (Table 1).**

**12.10) Alternative methods to achieve project objectives.**

**12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.**

**12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.**

### **SECTION 13. ATTACHMENTS AND CITATIONS**

Washington Department Fish and Game (WDFG). 1932. Annual Report for 1930-31. Washington Fish and Game. Seattle, WA.

Washington Department Fish and Game (WDFG). 1916. Annual Report for 1914-15. Washington Fish and Game. Seattle, WA.

Washington Department of Fisheries (WDF). 1938. Annual Report for 1937. Washington Department of Fisheries. Seattle, Wa.

Washington Department of Fisheries (WDF). 1939. Annual Report for 1938. Washington Department of Fisheries. Seattle, Wa.

Washington Department of Fisheries (WDF). 1941. Annual Report for 1940. Washington Department of Fisheries. Seattle, Wa.

Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, 2002, “Puget Sound Chinook Salmon Hatcheries, Resource Management Plan”, a component of Comprehensive Chinook Salmon Management Plan, August 23, 2002. 103 pages.

**SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY**

“I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.”

Name, Title, and Signature of Applicant:

Certified by\_\_\_\_\_ Date:\_\_\_\_\_

**Table 1. Estimated listed salmonid take levels by hatchery activity.**

<b>Listed species affected: Chinook ESU/Population: Puget Sound Activity: Hatchery fingerling/yearling Program</b>				
<b>Location of hatchery activity: Eastsound, Orcas Island Dates of activity: September -May Hatchery program operator: _Long Live the Kings Orcas Island/East Sound</b>				
<b>Type of Take</b>	<b>Annual Take of Listed Fish By Life Stage (<i>Number of Fish</i>)</b>			
	<b>Egg/Fry</b>	<b>Juvenile/Smolt</b>	<b>Adult</b>	<b>Carcass</b>
<b>Observe or harass a)</b>				
<b>Collect for transport b)</b>				
<b>Capture, handle, and release c)</b>			Unknown	
<b>Capture, handle, tag/mark/tissue sample, and release d)</b>				
<b>Removal (e.g. broodstock) e)</b>			Unknown	
<b>Intentional lethal take f)</b>				
<b>Unintentional lethal take g)</b>	Unknown	Unknown	Unknown	
<b>Other Take (specify) h)</b>				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.

b. Take associated with weir or trapping operations where listed fish are captured and transported for release.

c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.

d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.

e. Listed fish removed from the wild and collected for use as broodstock.

f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.

g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.

h. Other takes not identified above as a category.